

CLAIMS: (US, CA)

1. A diffraction grating alignment method for
5 aligning the longitudinal direction of grooves of a
diffraction grating in a predetermined direction, the method
comprising;
detecting a diffracted light pattern sent from the
diffraction grating; and
10 displacing the diffraction grating such that an
arranging direction obtained from the diffracted light pattern
is aligned in the predetermined direction.

2. The diffraction grating alignment method according
15 to claim 1, wherein detecting the diffracted light pattern
utilizes a screen that faces the diffraction grating, wherein
the diffracted light pattern is projected on the screen,
wherein a reference line extends in the predetermined
direction on the screen, and wherein an angle between the
20 arranging direction obtained from diffracted light pattern and
the reference line is detected.

3. The diffraction grating alignment method according
to claim 1, wherein detecting the diffracted light pattern
25 includes:
reading the diffracted light pattern;
displaying an image of the read diffracted light
pattern; and
calculating an angle between a reference line and an
30 arranging direction obtained from the diffracted light pattern,
wherein the reference line extends in the predetermined
direction.

4. The diffraction grating alignment method according
35 to claim 1, wherein detecting the diffracted light pattern

includes:

reading the diffracted light pattern;

recognizing the diffracted light pattern based on data
of the read diffracted light pattern and analyzing the
5 relative relationship between the diffracted light pattern and
the predetermined direction; and

displacing the diffraction grating based on a result
obtained by analyzing the relative relationship.

10 5. A diffraction grating alignment apparatus
comprising:

a placing device for placing a diffraction grating;

a displacing device for displacing the diffraction
grating located on the placing device;

15 a light source for radiating light on the diffraction
grating located on the placing device;

a detecting device for detecting a diffracted light
pattern sent from the diffraction grating based on radiation
of light from the light source; and

20 a control device for controlling the displacing device
to displace the diffraction grating such that the direction of
an arranging direction obtained from the diffracted light
pattern detected by the detecting device is aligned in the
predetermined direction.

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6. The diffraction grating alignment apparatus
according to claim 5, wherein the detecting device is a screen
that faces the diffraction grating, wherein the diffracted
light pattern is projected on the screen, and wherein a
30 reference line is located on the screen to extend in the
predetermined direction.

7. The diffraction grating alignment apparatus
according to claim 5,
35 wherein the detecting device includes an image reading

device for reading the diffracted light pattern and a display device for displaying an image of the diffracted light pattern read by the image reading device, and

wherein the display device displays a reference line
5 with the diffracted light pattern, and wherein the reference line extends along the predetermined direction.

8. The diffraction grating alignment apparatus according to claim 6,

10 wherein the placing device is a turntable, and wherein the displacing device is a rotary motor for rotating the turntable, and

wherein the control device controls the rotary motor based on a switch, and wherein the switch is manipulated to
15 rotate the rotary motor in forward and reverse directions.

9. The diffraction grating alignment apparatus according to claim 5,

wherein the detecting device includes an image reading
20 device and an analyzing device, wherein the image reading device reads the diffracted light pattern, wherein the analyzing device recognizes the diffracted light pattern based on data of diffracted light pattern read by the image reading device, and wherein the analyzing device analyzes the relative
25 relationship between the diffracted light pattern and the predetermined direction, and

wherein the control device controls the displaying device based on an analysis result of the analyzing device to displace the diffraction grating.

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10. The diffraction grating alignment apparatus according to claim 9,

wherein the placing device is a turntable, and wherein the displacing device is a rotary motor for rotating the
35 turntable, and

wherein the control device controls the rotary motor based on the analysis result of the analyzing device.

11. The diffraction grating alignment apparatus
5 according to claim 5, further comprising a machining device for machining the diffraction grating that is aligned on the placing device.

12. The diffraction grating alignment apparatus
10 according to claim 11, wherein the machining device is a cutter.

13. The diffraction grating alignment apparatus
according to claim 5, wherein the light source is a laser
15 light source, and wherein the diffracted light pattern includes a plurality of diffracted lights.

14. The diffraction grating alignment apparatus
according to claim 9, wherein the image reading device is a
20 CCD camera.